

In the outstanding Office Action, the Examiner rejected claims 1-5, 9, 12-14, 16, 17, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Korean reference no. KR20020046534 (hereinafter *Chun*) in view of U.S. Patent No. 6,101,892 to *Berlinger, Jr. et al.* (hereinafter *Berlinger*). Claims 6-8 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Chun* and *Berlinger*, taken further in view of U.S. Patent No. 2,760,381 to *Pickles* (hereinafter *Pickles*). Claims 10, 11, and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Chun* and *Berlinger*, taken further in view of U.S. Patent Application Publication No. 2002/0051860 to *Hiroi et al.* (hereinafter *Hiroi*). These rejections, as applied to the revised claims, are respectfully traversed.

Rejections Under 35 U.S.C. §103

The Examiner rejected claims 1-5, 9, 12-14, 16, 17, and 19 under 35 U.S.C. §103(a) as unpatentable over *Chun* in view of *Berlinger*. Claims 6-8 and 18 were rejected under 35 U.S.C. §103(a) as unpatentable over *Chun* and *Berlinger*, taken further in view of *Pickles*. Claims 10, 11, and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Chun* and *Berlinger*, taken further in view of *Hiroi*. *Chun* was cited as showing an auxiliary drive in which a first toothed wheel is made of plastic, with tooth flanks meshing. *Berlinger* is cited as allegedly showing an involute-free mesh profile in a force transmission area, and a transition from a concave area directly to a convex area. The Office Action further alleges that effective profiles of *Berlinger's* tooth flanks match in a manner that the meshing of the tooth flanks occurs at planiform contact regions. *Pickles* and *Hiroi* were cited as showing additional features in the dependent claims.

Response

This rejection is traversed on the legal basis as set forth in Applicants' response of October 6, 2009. Additionally, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the

time the invention was made. *Amgen Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991).

Chun is acknowledged as not describing the tooth flanks of said toothed gear wheels comprising an involute-free mesh profile in the force transmission area, and transition from a concave area directly to a convex area, effective profiles of said tooth flanks matching in a manner that the meshing of the tooth flanks occurs at planiform contact regions along their complete height. *Berlinger* is described in the Office Action as showing an involute-free mesh profile in the force transmission area. It is pointed out, however, that *Berlinger* specifically describes the opposite -- i.e., a mesh profile which includes an involute profile:

"FIG. 2 shows the transverse section profiles of a IS-tooth pinion and a 90-tooth gear, which may be designed so that there no contact is made along the transition zones 20a and 22a. It is important to note that due to the scale of FIG. 2, and the slight and subtle nature of the transition zone it is impossible to discern simply by observing FIG. 2 the fact that no contact is made, at the flanks which are in contact, along the transition zone. ..." (sic., *Berlinger* at Column 5, lines 4-16; emphasis added.)

Not only does *Berlinger* describe a gear structure with an involute profile, but the reference also describes its operation. Accordingly, it is submitted that *Berlinger* "teaches away from" the provision of an involute-free mesh profile.

Going back to the primary reference, *Chun* shows an arrangement in which angled gears are used, but with no further graphical depiction of gear mesh angles.

This fails to suggest the subject matter as described in Applicants' claims:

"... a first ... and a second toothed gear wheel[s] ... comprising an involute-free mesh profile in the force transmission area and transition from a concave area directly to a convex area, effective profiles of said tooth flanks matching in a manner that the meshing of the tooth flanks occurs at planiform contact regions, linearly viewed in cross section, along their complete height" (Claim 1; claim 16 similar.)

As previously indicated, Applicants' claims set forth a configuration in which the mesh profile transitions from a concave area directly to a convex area. This results in reducing gear mesh noise, while at the same time achieving a high bearing and high load capability over the

entire rolling contact zone. This allows engine impulses, transferred to counterbalance mechanisms, engine auxiliary drives, etc., to be transferred with low noise and low wear.

Applying the combination of *Chun* and *Berlinger*, one would not have an expectation of success under *Amgen Iv. Chugai* because the description of the specific contract profiles, set forth in *Berlinger*, is that, "no contact is made along the transition zones."

As pointed out in Applicants' response of October 6, 2009, *Chun* merely uses a plastic gear, but fails to suggest a particular construction relevant to Applicants' subject matter. There is no description in *Chun* of how to construct a gear configured according to claim 1 and therefore no suggestion of how to construct the gear from synthetic material. Instead, *Chun* merely describes forming gear wheels from synthetic material. While gear noise is described by *Chun*, there is no suggestion that the gear noise be controlled by the transition from the concave area provided with profiles of said tooth flanks matching in a manner that the meshing of the tooth flanks occurs at planiform contact regions, linearly viewed in cross section, along their complete height.

Applicant therefore respectfully request that the Examiner withdraw the rejections and the case be passed to issuance.

Claim 14

The Office Action asserts that, while *Chun* does not expressly disclose the use of straight-toothed spur gears, the design of *Chun* can be modified according to *Berlinger*. It is respectfully submitted that a modification according to *Berlinger* would fail to provide an involute-free mesh profile as set forth in independent claim 1.

Claims 6-8 and 18

Claims 6-8 and 18 are rejected by applying the further reference to *Pickles* to show the use of tooth thickness of the teeth of the gear wheel made of metal being less than the thickness of the teeth of the plastic gear wheel. In addition to this not suggesting the involute-free mesh

profile in the force transmission area, it is pointed out that there is no suggestion in *Pickles* to modify the *Chun* arrangement. Instead, *Pickles*' description is limited to straight gears.

Moreover, *Pickles* specifically describes that the combination of plastic and metal is used in an involute gear system:

"... In the illustration, a standard 14½ degree involute gear system is shown, although it will be understood that the invention is equally applicable to other gear systems."
(*Pickles* at column 2, lines 69-72)

Accordingly, *Pickles* clearly "teaches away from" Applicants' involute-free gearset.

CONCLUSION

In light of the foregoing, Applicants submit that the application is in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner call the undersigned.

Respectfully submitted,
THE NATH LAW GROUP

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THE NATH LAW GROUP
112 South West Street
Alexandria, VA 22314-2891
Tel: 703-548-6284
Fax: 703-683-8396

/Stan Protigal/
Jerald L. Meyer
Registration No. 41,194
Derek Richmond
Registration No. 45,771
Stanley N. Protigal
Registration No. 28,657
Customer No. 20529